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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/068,459

02/06/2002

Richard R. Bijjani

P0736/7001 RJP

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23628

7590

10/29/2003

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EXAMINER

HO, ALLEN C

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 10/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/068,459

Applicant(s)

BIJJANI ET AL.

Examiner

Allen C. Ho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-32 is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.6 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. Fig. 5 is objected to because y_1 , y_2 , and y_3 should be z_1 , z_2 , and z_3 (page 11, lines 22-23).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a multiple energy prescanner having a high-energy x-ray source and a low-energy x-ray source as claimed in claim 11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance

Claim Objections

3. Claim 8 is objected to because of the following informalities: line 2, "item" should be replaced by --object--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 10 and 12-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10 and 12-19 fail to claim an x-ray pre-scanner as disclosed in the specification.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 2, 6, 7, and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Krug *et al.* (U. S. Patent No. 5,838,758).

With regard to claim 1, Krug *et al.* disclosed a method (Fig. 18a) for analyzing an object comprising: pre-scanning the object using a multiple-energy x-ray device (1000) to determine information indicative of effective atomic characteristics of the object (This is inherent for a dual-energy x-ray device); and conducting scans of areas of interest of the object with a computed tomography device based on the information (column 32, lines 18-37).

With regard to claim 2, Krug *et al.* disclosed the method of claim 1, further comprising transmitting the information to a processor (inherent for a CT) coupled to the computed tomography device (column 32, lines 35-37).

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With respect to claim 6, Krug *et al.* disclosed the method of claim 1, further comprising: using the information to determine density characteristics of the object (column 1, lines 23-25).

With regard to claim 7, Krug *et al.* disclosed the method of claim 1, further comprising: using the information to determine a plane (slice) of the object to be scanned (column 32, lines 32-33).

With regard to claim 10, Krug *et al.* disclosed an apparatus (Fig. 18A) for analyzing an object comprising: a multiple-energy prescanner (100) that prescans the object; and a computed tomography device (1002) that scans only areas of interest of the object based on information determined in the prescan (column 32, lines 18-37).

With regard to claim 11, Krug *et al.* disclosed the apparatus of claim 10, wherein the multiple-energy prescanner has a high-energy x-ray source and a low-energy x-ray source (This is inherent, either they are integrated or separated).

With regard to claim 12, Krug *et al.* disclosed the apparatus of claim 10, further comprising a conveyor (5) for transporting the item from the multiple-energy prescanner to the computed tomography device.

8. Claim 1, 2, 6, 7, and 10-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Ellengogen (US 2002/0172324 A1).

With regard to claim 1, Ellengogen disclosed a method for analyzing an object comprising: pre-scanning (paragraph [0070], lines 12-15) the object using multiple energy x-ray device (paragraph [0052]) to determine information indicative of effective atomic number characteristics of the object (This is inherent for a dual-energy x-ray device. See U. S. Patent

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No. 5,319,547); and conducting scans of areas of interest of the object with a computed tomography device based upon the information (paragraph [0070]).

With regard to claim 2, Ellengogen disclosed the method of claim 1, further comprising transmitting the information to a processor (inherent for a CT) coupled to the computed tomography device (paragraph [0070], lines 15-19).

With regard to claim 6, Ellengogen disclosed the method of claim 1, further comprising: using the information to determine density characteristics of the object (paragraph [0008], lines 4-5).

With regard to claim 7, Ellengogen disclosed the method of claim 1, further comprising: using the information to determine a plane of the object to be scanned (This is inherent, since a CT device images slices or planes).

With regard to claim 10, Ellengogen disclosed an apparatus for analyzing an object comprising: a multiple energy prescanner (paragraph [0052]) that prescans the object; and a computed tomography device that scans only areas of interest of the object based on information determined in the prescan (paragraph [0070]).

With regard to claim 11, Ellengogen disclosed the apparatus of claim 10, wherein the multiple-energy pre-scanner has a high-energy x-ray source and a low-energy x-ray source (This is inherent, either they are integrated or separated).

With regard to claim 12, Ellengogen disclosed the apparatus of claim 10, further comprising a conveyor (14) for transporting the item from the multiple-energy prescanner to the computed tomography device.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) as applied to claim 2 above, and further in view of Han (U. S. Patent No. 6,125,193).

With regard to claim 3, Krug *et al.* disclosed the method of claim 2. However, Krug *et al.* failed to teach that the method further comprises performing a metal artifact correction based on the information.

It is known that a dual-energy x-ray device could determine an effective atomic number of a material; thus, it is possible to identify a metallic object.

Han disclosed a method for correcting artifacts caused by metals (column 1, lines 13-34). Han taught that these artifacts obscure diagnostic information (column 1, line 34).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform a metal artifact correction based on the information, since a person would be motivated to correct for metal artifacts if the information contains the presence of metallic objects.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) and Han (U. S. Patent No. 6,125,193) as applied to claim 3 above, and further in view of Raupach (U. S. Patent No. 6,600,801 B2).

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With regard to claim 4, Krug *et al.* in combination with Han disclosed the method of claim 3. However, Krug *et al.* and Han failed to teach performing a metal artifact correction that includes performing a beam-hardening correction.

Raupach taught that materials with high atomic number and density cause beam-hardening artifacts in a CT image, which leads to misinterpretation (column 1, lines 29-36). Raupach disclosed a method for performing a beam-hardening correction.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform a beam-hardening correction, since a person would be motivated to avoid misinterpretation.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) and Han (U. S. Patent No. 6,125,193) as applied to claim 3 above, and further in view of Ohnesorge *et al.* (U. S. Patent No. 5,666,391).

With regard to claim 5, Krug *et al.* in combination with Han disclosed the method of claim 3. However, Krug *et al.* and Han failed to teach performing a metal artifact correction that includes performing a scatter correction.

Ohnesorge *et al.* taught that scattered radiation causes artifacts in an image, which makes interpretation difficult (column 1, lines 15-18). Ohnesorge *et al.* disclosed a method for performing a scatter correction.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform a scatter correction, since a person would be motivated to avoid misinterpretation.

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13. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) in view of Han (U. S. Patent No. 6,125,193).

With regard to claims 8 and 9, Krug *et al.* disclosed a method (Fig. 18a) for analyzing an object comprising: pre-scanning the object using a multiple-energy x-ray device (1000) to determine prescan information; transmitting the prescan information to a processor (inherent in a CT) coupled to a computed tomography (column 32, lines 32-37); and performing a computed tomography scan of a plane (slice) of the object based on the prescan information (column 32, lines 32-33).

However, Krug *et al.* failed to teach performing a metal artifact correction on the computed tomography scan based on the prescan information if the plane intersects an area or near a metal object.

It is known that a dual-energy x-ray device could determine an effective atomic number of a material; thus, it is possible to identify a metallic object.

Han taught that the metal artifacts obscure diagnostic information (column 1, line 34). Han disclosed a method for correcting artifacts caused by metals (column 1, lines 13-34).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform a metal artifact correction based on the information, since a person would be motivated to correct for metal artifacts if the prescan information contains the presence of metallic objects.

14. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) as applied to claim 10 above, and further in view of Gordon *et al.* (U. S. Patent No. 5,661,774).

With regard to claim 13, Krug *et al.* disclosed the apparatus of claim 10. However, Krug *et al.* failed to teach that the computed tomography device is a multiple-energy computed tomography device.

Gordon *et al.* disclosed a dual-energy computed tomography device. Gordon *et al.* taught that the dual-energy technique allows one to determine an indication of a material's atomic number in addition to simple density measurement (column 1, lines 24-31).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ a dual-energy computed tomography device, since a person would be motivated to identify a material by using its atomic number.

15. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758).

With regard to claim 14, Krug *et al.* disclosed an apparatus for analyzing an object comprising: a multiple-energy pre-scanner (1000); and a computed tomography device (1002); wherein information indicative of suspect objects is transmitted from the multiple-energy pre-scanner to the computed tomography device (column 32, lines 32-37).

However, Krug *et al.* failed to teach that information indicative of at least one metal artifact is transmitted from the multiple-energy pre-scanner to the computed tomography device.

It is known that a dual-energy x-ray device could determine an effective atomic number of a material; thus, it is possible to identify a metallic object.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to transmit information indicative of at least one metal artifact from the

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multiple-energy pre-scanner to the computed tomography device, since a person would be motivated to examine a metal artifact in detail as most weapons have metallic components.

Allowable Subject Matter

16. Claims 15-19 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

17. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 15-19, the prior art fails to teach or fairly suggest determining whether to update the first information based on the second information, as claimed in claim 15.

18. Claims 20-32 are allowed.

19. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 20 and 21, the prior art discloses an x-ray prescanner that determines information indicative of a location of a target object, and a computed tomography device that performs a scan based on the information. However, the prior art fails to teach or fairly suggest that the resulting computed tomography scan is used to determine whether to modify the information, as claimed in claim 20.

With regard to claims 22-26, the prior art discloses an x-ray device that pre-scans an object, and a computed tomography device that scans selected areas of the object based on the pre-scan. However, the prior art fails to teach or fairly suggest the computed tomography device transmitting density information resulting from a scan to the x-ray device, as claimed in claim 22.

With regard to claim 27, the prior art discloses a x-ray device that determines a first information about an object, and a computed tomography device that scans the object based on the first information to determine a second information. However, the prior art fails to teach or fairly suggest that a processor determines whether to update the first information based on the second information, as claimed in claim 27.

With regard to claims 28-31, the prior art discloses a method comprising the steps of pre-scanning an item using a multiple-energy x-ray device and transmitting a first information to a computed tomography device, and performing a computed tomography scan based on the first information. However, the prior art fails to teach or fairly suggest transmitting a second information from the computed tomography device to the multiple-energy x-ray device, as claimed in claim 28.

With regard to claim 32, the prior art discloses a multiple-energy x-ray device that prescans an object to determine a first information, and a computed tomography device that performs a scan based on the first information to determine a second information. However, the prior art fails to teach or fairly suggest a processor that determines whether to update the first information based on the second information, as claimed in claim 32.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) McClelland *et al.* (U. S. Pub. No. 2002/0176531 A1) disclosed a system for remote inspection.
- (2) Gayer *et al.* (U. S. Patent No. 6,094,467) disclosed a method for improving CT images having high-attenuating objects.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (703) 308-6189. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (703) 308-4858. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

Allen C. Ho

Allen C. Ho
Patent Examiner
Art Unit 2882

ACH